



Pacific Island Network Quarterly

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The Next New Thing

NPS Web Mapping

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The National Park Service (NPS) has implemented natural resource inventory and monitoring on a servicewide basis to ensure all park units possess the resource information needed for effective, science-based management, decision-making, and resource protection.

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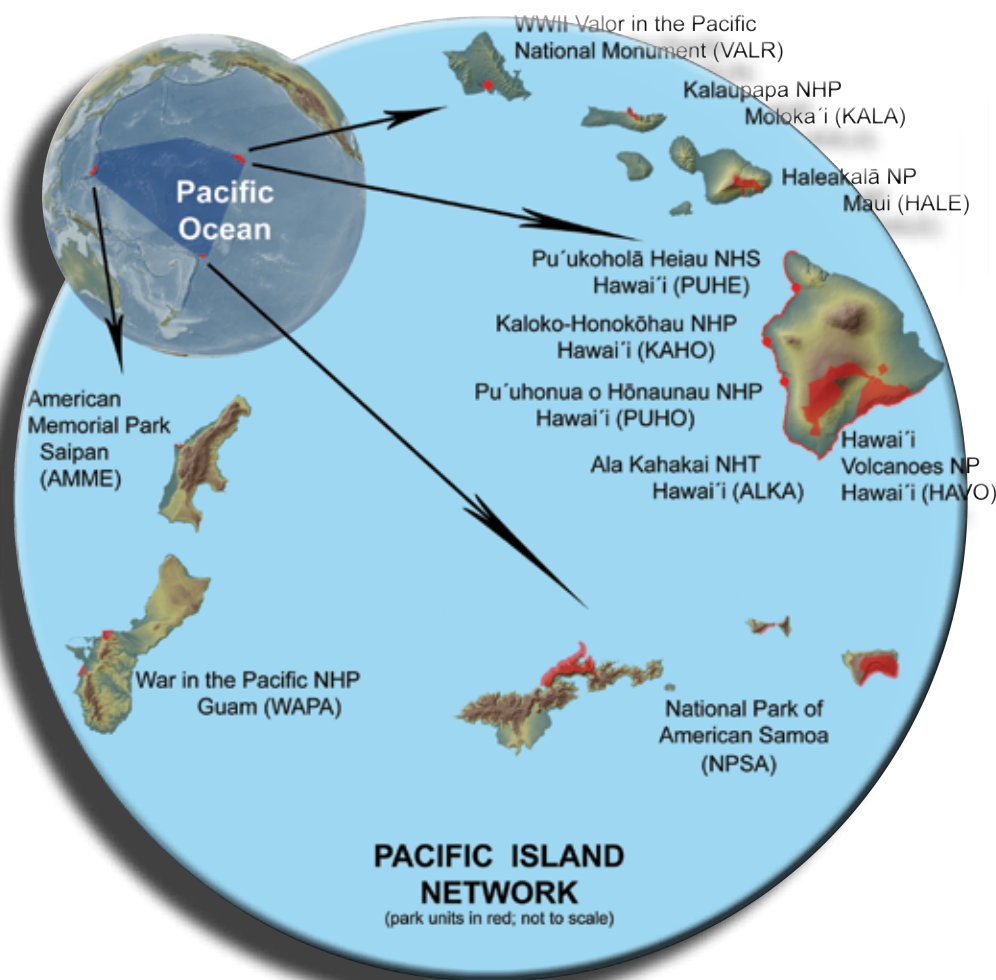
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NOTE: Unless indicated all photos and articles are NPS.

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Field Schedule

	January	February	March
Landbird monitoring			
Invasive plants	HALE	HALE	
Vegetation communities	HALE		
Water quality	HALE	KAHO, KALA, WAPA AMME	PUHO, PUHE ALKA, NPSA
Stream animals		WAPA	
Ground water		KAHO, AMME	
Benthic marine			NPSA
Marine fish			NPSA
Vegetation mapping		HAVO, KALA	HALE, KALA, HAVO
Climate (on-going)	All Parks -----	-----	-----



Because You Never Know



"On my recent trip to Haleakalā National Park everything was business as usual. That changed last summer. "

As someone who frequently works in remote parts of national parks where immediate access to medical care is limited, I value any first aid training available to me. In November of 2011, I participated in a Wilderness First Responder class. This 10-day intensive class focused on honing practical medical skills. I immediately felt better prepared to take care of myself and others, and now before every major trip to the field, I take an online refresher course in basic first aid and CPR. I've rarely had to use my skills in the field, and only on small cuts and scrapes. That changed last summer.

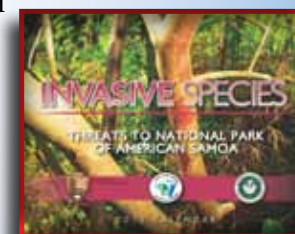
On my most recent water quality sampling trip to the Kīpahulu area of Haleakalā National Park everything was business as usual. My coworker, Liz Moore, and I were hiking up the Pipiwai Trail collecting water samples when we encountered a woman and her friend sitting on the trail. She was clutching her ankle. It was clear she was in pain. We approached her, identified ourselves and began assessing the situation. They described hearing a snap as the woman twisted her ankle while hiking. It was clearly swollen and she was having problems putting any weight on it. We were a little over a mile up the trail and knew that the woman would not be able to hike down the trail on her own.

I immediately thought back to my training. We radioed headquarters to ask for assistance in transporting the woman to safety. I remembered there is a nearby road used for trail maintenance, and knew that we could get her to a point where she could be picked up in a vehicle and driven to further care. Once we knew that help was on the way, we tended to the injury with the acronym R.I.C.E. (Rest, Ice, Compression, Elevation) ringing in my ears. We used a method called the "crutch carry" to help her down the trail to a point where she could be picked up. She was very grateful that park staff was there to help. I feel lucky that I was able to help a visitor. It's a reminder to always keep safety in mind and keep current with trainings because you never know when you'll need to aid a friend, a family member, or a stranger on a trail. Safe hiking!

—A. Farahi, NPS
Biological Technician

Invasive Species Cards and 2013 Calendars!

Each park will soon receive a custom-designed set of waterproof ID cards used to detect invasive plants, as well as attractive 2013 wall calendars featuring 12 aggressive invaders. "Early detection is the first and best line of defense." said Ali Ainsworth, I&M Botanist. The cards feature photos of the target species, helpful ID tips, and more.



Climate Change

"The Pacific Islands Regional Climate Assessment group released a report highlighting the findings of more than 100 scientists and other experts who assessed the state of knowledge about climate change and its impacts on the Hawaiian archipelago and the US-Affiliated Pacific Islands. The report also examines the adaptive capacity of island communities in the region."

—PIRCA web release

<http://dl.dropbox.com/u/29027750/PIRCA%202012%20Executive%20Summary.pdf>

Featured Staff

Sylvester "Sly" Lee joined the Pacific Island Network in October 2012 as a Marine Biological Science Technician working jointly with I&M and Kalaupapa National Historical Park. He hails from Oxford, Mississippi, and recently completed his MSc. Degree in environmental toxicology at the University of Mississippi. His master's research involved the adaptive tolerance to ocean acidification in the marine sponge, *Chondrilla nucula*. He enjoys medium to long walks on the beach and is ecstatic about his new work.





Easy Park Mapping App.

Access Park Maps without ArcGIS

"A server crash early in 2012 wiped out a previous version of our Geocortex web-mapping application. About the same time, the Pacific Island Network hired a new GIS Specialist, Scott Kichman, who completely redesigned the tool. Faster and easier than ArcGIS, the new application also serves as a platform to deliver data with a powerful spatial context."

—G. Kudray, NPS
PACN Program Manager

User Friendly

The application interface in Geocortex is simple to use, easy to maintain, and very similar to Bing™ and Google Map™ applications.

What You'll Find

The web maps are "park centric". Each map that you open contains baseline information relative to a particular park and, in some cases, the island that the park resides on. Within each map are imagery data including scaled USGS topography maps, and aerial and terrain imagery. Geocortex also links to I&M data, external spatial databases, files, and web services.

The main web page is a launch platform. As soon as you open the web page, you will see a Quickstart Guide link which gives more detailed information on how to use the application. From there you will have easy access to geospatial data such as basic park maps, park vegetation maps, bird monitoring

Simply go to
<http://pacn.maps.nps.gov/>

Pacific Island Network Mapping homepage.

plots, and much more. You can enable or hide data to get exactly what you want. As more monitoring data is collected, new information will be added to the maps.

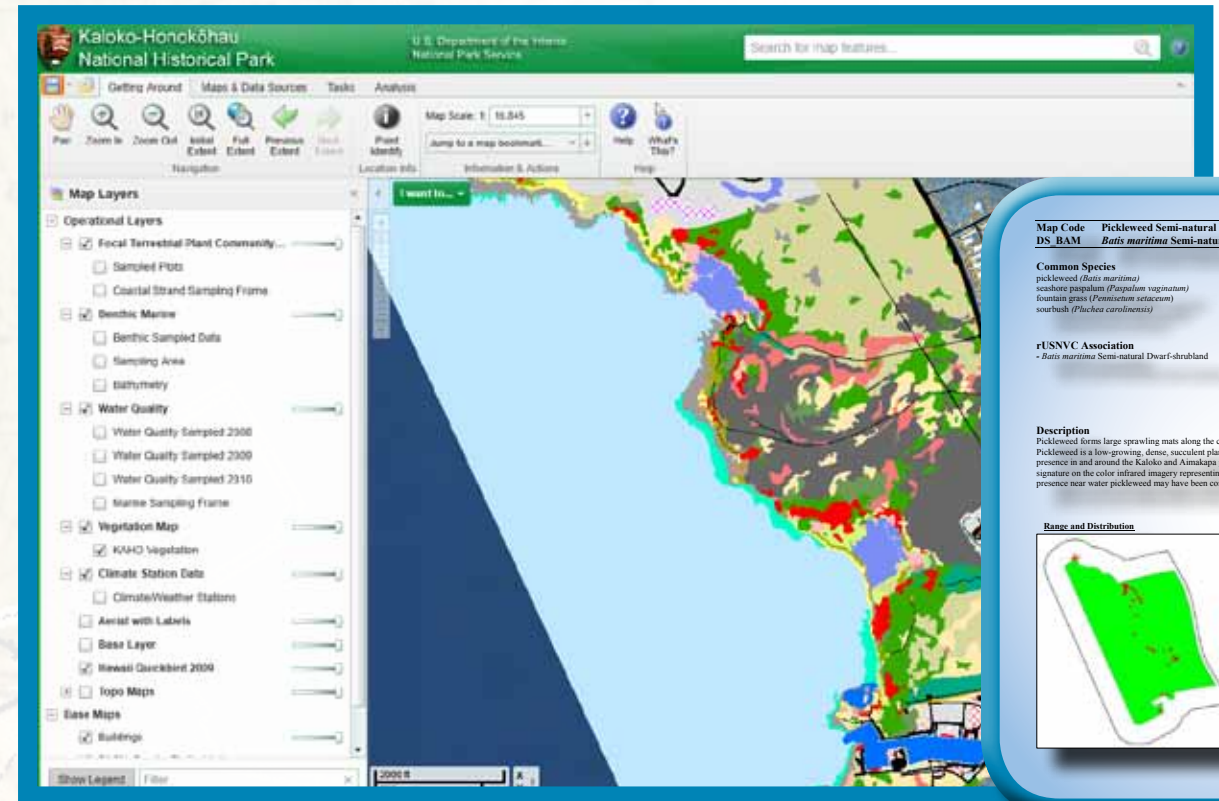
Also included are: NOAA/NWS links to extensive coastal data, weather forecasts for all national parks in the Pacific islands, current VOG conditions, VOG alerts, and PACN contact information.

Test it Out

The best way to see how fast and easy the program works is to give it a test drive. Go to the web page and zoom around, turn data off and on, and try to print a map. Have fun.

Currently, this new tool is restricted to NPS employees, partners, and approved contractors using NPS computers.

—S. Kichman, NPS
GIS Specialist



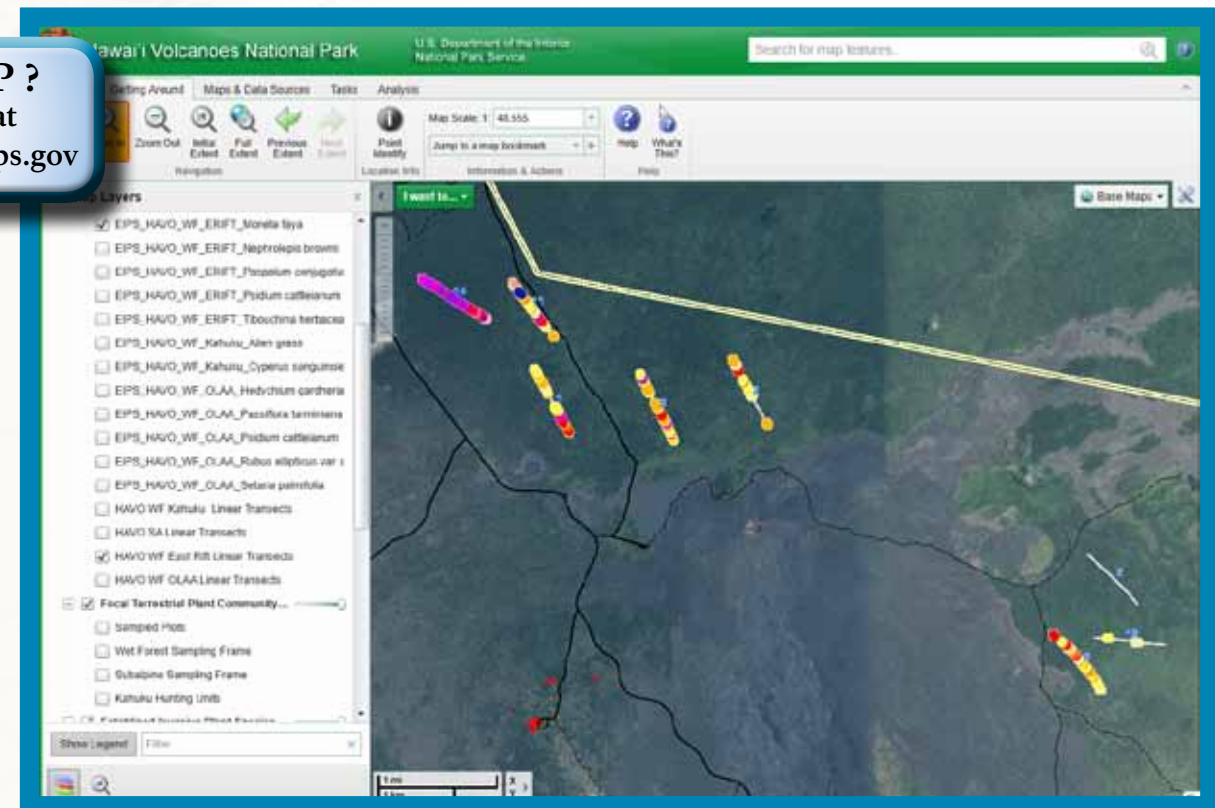
Vegetation map for Kaloko-Honokōhau National Historical Park. The Table of Contents shows GIS layers available to be turned off or on. There are base layers such as park boundaries, transportation, and background aerial imagery. There are also operational layers that display vital sign monitoring data and sampling information.

Users can click on a polygon to identify the vegetation type, then continue on to a pdf document with photos, species distribution, and other information about the vegetation.

NEED HELP ?
Contact Scott at
scott_kichman@nps.gov

Established Invasive Species data along 1,000 meter transects in the Nāhuku / East Rift zone of Hawai'i Volcanoes National Park.

Color dots represent the cover (dominance) of fire tree (*Morella faya*) with a spectrum of yellow (low) to purple (high). Other invasive species in the Table of Contents can also be selected.





Clear, Cool Streams in American Samoa

Sampling stream fauna is an exciting part of Inventory & Monitoring (I&M) Program work in the National Park of American Samoa (NPSA). The soothing sound of clear, cool water and the welcomed shade of overhanging trees makes a walk in or along a stream, a stress reducing experience. But a more compelling reason for studying these animals is that they are important to the riparian (stream) ecosystem.

Snails, or *sisi vai*, keep algae growth under control. They feed by scraping the algal film from rocks and other surfaces using a ribbon of teeth. The size, shape, texture, and color of their shells are important features for identification. Snail eggs are attached to submerged rocks or other hard surfaces in streams, or even attached to the shells of other snails. Although only a millimeter or two in size, the eggs are easily seen as clusters of white ovals or sesame-seed shapes against the dark rocks. Species such as *Clithon corona*, *Septaria suffreni*, *Septaria sanguisuga*, *Neritina canalis*, and *Melaniodes tuberculata* are found throughout Samoan streams. Snails are hand collected and released during the annual surveys.

Shrimp, *ula vai*, filter organic debris from flowing water and hunt insect larvae hiding among small stones. They are the most abundant mid-sized animals in Samoan streams. Most are only a few centimeters long and are well camouflaged. Others, belonging to the genus *Macrobrachium*, or "large arm", are easier to spot because of their larger size and bold behavior. Shrimp are an important food source for fishes,



The field crew works together to catch stream shrimp.



Shrimp are counted, identified, and released back to the stream.



The field crew meticulously identifies a shrimp.



A hermit crab decides to take some notes of its own.

birds, and people. During surveys, shrimp are caught with nets. Species such as *Atyoida pilipes*, *Caridina weberi*, *Macrobrachium lar*, and *Macrobrachium latimanus* are found during stream surveys.

Fishes, or *i'a vai*, are important food for large birds. People catch them for food and sport as well. Fish are not collected during surveys but they are identified and recorded when seen.

Stream animals are important indicators of the quality of the water. Healthy streams naturally have a balanced mix of native animals. During stream animal surveys, the water quality itself is also analyzed to ensure that streams remain healthy.

The I&M Program currently monitors three streams on Tutuila Island. Monitoring Fagatuitui Stream requires a long hike which is twice as hard on the way back. In contrast, Leafu and Amalau Streams only require a simple stroll from nearby villages. In the past, the I&M Program also sampled Laufuti stream on Ta'u Island, which is less influenced by humans than the Tutuila Island streams.

NPSA's freshwater animals are fascinating to study. Sharing this experience with others makes it even more enjoyable.

—V. Vaivai, NPS
Biological Technician

Native *Tuna* in the Streams ?

Tuna (in Samoan), is also known as the giant mottled eel, or the marbled eel (*Anguilla marmorata*).

Description: This freshwater eel has the widest distribution of the *anguillid* eels. It can be found in the tropical Indo-Pacific region from East Africa to French Polynesia as well as rivers in Japan and Mozambique. Adults are long and slender and have brown to black marbling on their backs over a greyish yellow base, and a white belly. They can reach lengths of 2 meters weighing a robust 20 kilograms, though they typically measure around 80 cm in American Samoa streams. This species is extremely long-lived with age estimates up to 40 years.

Habitat and Diet: Don't be alarmed if you see an eel slithering your way. *Tuna* are capable of limited overland travel, especially during rainy periods which keep their skin moist out of water. They can be found in all areas of the stream from the mouth to the headwaters. They are primarily nocturnal and eat a wide range of prey including crabs, fish, and frogs.



Occasionally, a giant mottled eel will move about on land for a short time in search of food.

Reproduction: *Tuna* spend their adult lives in freshwater or estuaries, but migrate to the ocean to reproduce. Their leaf-shaped larvae drift into the ocean and hide among plankton for about 4 months before returning to streams. Young migrate upstream feeding and growing for 8-20 years before returning to the sea to reproduce.



The field crew carefully removes an eel from a shrimp net during a survey.

Threats: Eels, like all freshwater fish, are cold-blooded and breathe using gills. Since they cannot regulate body temperature, their bodies are the same temperature as the water. Temperature affects the eels' metabolism and the amount of oxygen in the stream. In undeveloped areas with abundant tree cover, the water temperature remains relatively constant; therefore, the animal's metabolism and amount of oxygen in the water will also be relatively constant. However, in more developed areas where land has been cleared for housing or agriculture, the water is more exposed to the sun and temperature fluctuations during the day. The warmer water increases the eels' metabolism making them hungrier. The relative warmth simultaneously decreases the

amount of oxygen in the water, which makes it more difficult for *tuna* to breathe.

Additionally, pollution such as sewage or agricultural runoff from surrounding development further depletes oxygen levels in the water. Since these animals need to access the ocean as part of their life cycle, they may need to travel through more open areas as part of their journey to or from the ocean. If the amount of dissolved oxygen in the water is low due to lack of shade or elevated pollution, the animals' progress may be deterred.

The Inventory & Monitoring Program monitors animal populations annually, and water quality parameters quarterly. Monitoring includes vital measurements such as temperature and dissolved oxygen.

Giant Mottled Eels in PACN National Parks:

The giant mottled eel is common in streams on Tutuila and Ta'u Islands in the National Park of American Samoa. This species is also found in Asan Stream on the island of Guam in War in the Pacific National Historical Park.

—A. Farahi, NPS
Biological Technician

Caught on Video: We captured this *tuna* on video last time the stream crew was working in American Samoa. www.youtube.com/watch?v=znXY0WEvvu0

Juvenile 'I'iwi Detected in Lower Elevations of Hawai'i Volcanoes National Park

The Hawaiian islands are home to a diverse array of plants and animals found nowhere else on Earth. Among the most famous of these are the spectacular Hawaiian honeycreepers, a group that evolved from a single flock of ancestral finches into at least 54 unique species. Unfortunately, the same isolation that fostered such dramatic adaptive radiation left Hawaiian species vulnerable.

Under the onslaught of alien species predation and competition, habitat degradation, and introduced infectious diseases and parasites, most of the surviving honeycreepers have become largely confined to higher elevations. Intact habitat exists above the warm-weather range of deadly introduced avian malaria (*Plasmodium relictum*), and its mosquito vector (*Culex quinquefasciatus*).

Hawai'i Volcanoes National Park is home to several of the remaining species of Hawaiian honeycreeper and protects thousands of acres of their native habitat. However, even within the park, native birds struggle with habitat fragmentation and degradation caused by invasive plants and animals, or volcanic activity. At elevations below about 1,500 meters they risk exposure to mosquitoes carrying the avian malaria parasite.

Consequently, species such as the iconic 'i'iwi (*Vestiaria coccinea*) have disappeared from much of the park, and their range has been reduced to forest fragments high on the slopes of Mauna Loa.

That's why it came as a surprise when USGS Biologist Jacqueline Gaudioso, and interns Angela Beck and Alexandria Vickery captured 'i'iwi in the park at 'Ainahou (956 meters) while mist-netting.

The scientists were conducting a survey for the prevalence of avian disease and ectoparasites at 'Ainahou for several weeks during this summer's māmane (*Sophora chrysophylla*) bloom. This endemic tree produces clusters of abundant yellow flowers, and its desirable nectar attracts nectivorous honeycreepers. The crew had captured Hawai'i 'amakihi (*Hemignathus virens*) and 'apapane (*Hematione sanguinea*) in abundance (these two endemic birds are more malaria-tolerant, and can be found at lower elevations), as well as introduced birds such as Japanese white-eye (*Zosterops japonicus*). They weren't anticipating any surprises.

However, during a net run in July, 2012 the crew caught a bird with mottled plumage and a long, curved bill; a juvenile 'i'iwi. This was exciting. Since the 1930s 'i'iwi have become increasingly scarce in the region, and no 'i'iwi had been detected near 'Ainahou in decades. The crew captured a second juvenile 'i'iwi the following day.

Are these juveniles vagrants, or do they represent the young of a local pair? "It's highly unlikely that they were born in the region," says USGS Biologist Paul Banko, who studies 'i'iwi in the park. "It's probable that they are dispersing young, although they would've had to go a long way.



One of two 'i'iwi captured at 'Ainahou in Hawai'i Volcanoes NP. The juveniles' cryptic plumage camouflages them in dense foliage. (Photo: J. Gaudioso)

I don't think any 'i'iwi are breeding below 4,000 feet (1,219 meters). There's bound to be one or two, but we're not aware of them." The juveniles caught at 'Ainahou may have traveled miles to get there.

It's hard to say why these juveniles would travel so far. Is it possible that they were looking for food or other 'i'iwi due to poor conditions where they fledged? Did they follow 'apapane to a seasonal source of nectar? Until further research can be done, we just don't know. " 'I'iwi are known to travel widely, which does put them at risk, but can also be beneficial," says Banko. "It exposes them to disease and predation, but allows them to escape scarcity. It's a time that's fraught with peril for young birds. We're lucky they landed in this spot where there are a lot of resources. It's great we banded them. Maybe we'll see them again!" Let's hope so.

—J. Gaudioso, Biologist,
USGS-PIERC

—A. Beck, U.H. Hilo

Although this is not an I&M Program project, I&M monitors landbirds every five years in the nearby East Rift Zone. We will keep our eyes and ears open for 'i'iwi when we return in 2015.